

Ross, Brian

From: D'Avignon, Mark R SPN <Mark.R.D'Avignon@usace.army.mil>
Sent: Friday, November 13, 2015 3:38 PM
To: Ross, Brian
Cc: Lawrence, Robert J SPN
Subject: RE: Redwood City Berths - no need for post-dredge z-layer sampling? (UNCLASSIFIED)

Categories: Record Saved - Shared

CLASSIFICATION: UNCLASSIFIED

Hi Brian,

Rob is out today, but I believe we can inform the Port that the post-dredge z-layer sampling and testing is no longer required. We put it in our DOP letter to be safe. We can do that next week. I think an email should suffice for our purposes, but I'll discuss it with Rob next week.

Thanks. Have a good weekend.

Mark

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<http://www.spn.usace.army.mil/Missions/DredgingWorkPermits.aspx>

-----Original Message-----

From: Ross, Brian [mailto:Ross.Brian@epa.gov]

Sent: Friday, November 13, 2015 3:12 PM

To: Ota, Allan <Ota.Allan@epa.gov>; Anniken Lyden <Annikenl@bcdca.gov>; Beth Christian <echristian@waterboards.ca.gov>; Brenda Goeden - BCDCA (brenda.goeden@bcdca.gov) <brenda.goeden@bcdca.gov>; O'Leary, Debra A SPN <Debra.A.O'Leary@usace.army.mil>; Heather Perry (Heather.Perry@bcdca.gov) <Heather.Perry@bcdca.gov>; Siu, Jennifer <Siu.Jennifer@epa.gov>; D'Avignon, Mark R SPN <Mark.R.D'Avignon@usace.army.mil>; Pascale Soumoy <pascales@bcdca.gov>; Lawrence, Robert J SPN <Robert.J.Lawrence@usace.army.mil>; Sarah Azat (Sara.Azat@noaa.gov) <Sara.Azat@noaa.gov>; Sweatt, Shelah SPN <Shelah.Sweatt@usace.army.mil>; Tong Yin (tyin@waterboards.ca.gov) <tyin@waterboards.ca.gov>

Subject: [EXTERNAL] Redwood City Berths - no need for post-dredge z-layer sampling?

Hi all,

With help from Jeff Cotsifas and Justin Wilkins (the ERED database manager at ERDC), Beth and I have now spent a good bit of time looking into the Fluoranthene TRV issue. You'll recall it was the TRV for Fluoranthene (listed in ERD as 220 ppb) that was estimated to be significantly exceeded in the site-specific TBP evaluation Jeff prepared for DMMO, for the Redwood City berths.

It turns out that, as Jeff discovered, the Fluoranthene TRV used was based on 2 papers (by Eertman, in 1993 and 1995) that really don't provide good quantitative data on the tissue burdens associated with the reproductive effects they identified. We feel that these papers are not an adequate basis for setting that particular TRV. Specifically, in addition to not providing direct measurements of the actual tissue burden, the exposure route was water-only. Our factors for screening appropriate entries in ERED for San Francisco Estuary projects include: sediment exposure; non-freshwater species; invertebrate species; and whole-body endpoints (such as growth, reproduction, and mortality). Behavioral, physiological, and cellular endpoints are discounted (unless more preferred endpoints are unavailable) largely because the consequences of the effect measured are usually very difficult to clearly translate into adverse organism, population, or community impacts.

Having decided not to use the Eertman data, we obtained an up-to-date version of ERED from Justin to work from (attached, so all have it). (You may remember that since the ERDC web site was hacked some months ago, there has been no on-line access to ERED at all.) We screened ERED using the factors listed above, and then looked for the lowest "effect" concentrations from among the remaining 30-40 entries.

We are now down to 2 data sets for Fluoranthene that are our prime candidates as the basis for a Fluoranthene TRV. One is for a polychete (*Streblospio benedicti*), where a tissue concentration of 73.14 mg/kg (wet weight) was the LD50. The other is for a copepod (*Schizopera knabeni*), where a tissue concentration of 40.5 mg/kg (ww) was the LD25.

Once a 20x "safety factor" is applied (to estimate a Lowest Observable Effects Dose from a lethal dose), the resulting TRV would be either 2,025 or 3,657 ppb depending on the study ultimately chosen. So, unlike earlier when we thought we had multiple core locations exceeding the TRV by an order-of-magnitude or more, the worst-case exceedance would now be localized and relatively minor. Using the lower of the candidate values as the TRV would mean only one z-layer sample from the Redwood City berths (DU2-04-Z, with a calculated steady-state tissue concentration estimate of 2,505 ppb) would slightly exceed the TRV. If the higher TRV were used, no z-layer samples would exceed it.

In either case, a weighted average exposure approach may now suffice. From Pacific EcoRisk's November 2 memo to DMMO, the predicted steady-state tissue concentration for the DU2 z-layer composite for

Fluoranthene was about 269 ppb, which is well below either candidate TRV. On this basis, there appears to be no need to do post-dredged z-layer sampling at all.

What remains now is to settle on a final TRV for Fluoranthene. We need to review the original papers that these two values come from, to confirm whether one or both are equally valid per our selection factors (there is some question about whether the copepod number was in fact statistically significant as an "effect" concentration). I have asked ERDC for copies of the two papers, and we will then be able to identify a final appropriate Fluoranthene TRV. But, for the Redwood City Berths, the TRV choice should not matter. The average exposure immediately after dredging will be well below either candidate TRV, and shoaling will rapidly reduce even that exposure still further.

Remember of course that this evaluation pertains ONLY to the Redwood City berths, since all the calculations are based on site-specific BSAFs from actual bioaccumulation testing of the overlying material. In another situation the bioavailability may be much different, and a tissue TRV exceedance could occur at much lower sediment concentrations. So while we will be determining a new TRV to apply to all projects, that does not mean that the elevated sediment PAH concentrations in the Redwood City berth z-layer would be "acceptable" elsewhere.

So, who tells Redwood City and what do "we" pass along to NMFS?

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Brian Ross

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